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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/669,492	09/24/2003	William Brown Farnham	SR0021USNA	6800

23906 7590 02/23/2005

E I DU PONT DE NEMOURS AND COMPANY  
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WILMINGTON, DE 19805

EXAMINER
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LEE, SIN J

ART UNIT	PAPER NUMBER
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1752

DATE MAILED: 02/23/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/669,492

Applicant(s)

FARNHAM ET AL.

Examiner

Sin J. Lee

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 26 November 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-26 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4, 6-12, 14 and 18-26 is/are rejected.
- 7) ☒ Claim(s) 5, 13 and 15-17 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)             | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                                    |

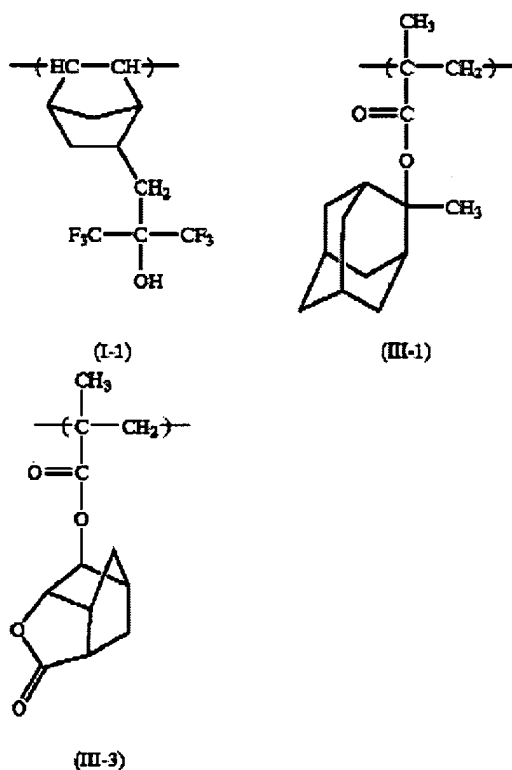
### DETAILED ACTION

1. Due to newly cited prior arts, the following rejections are made *non-final*.

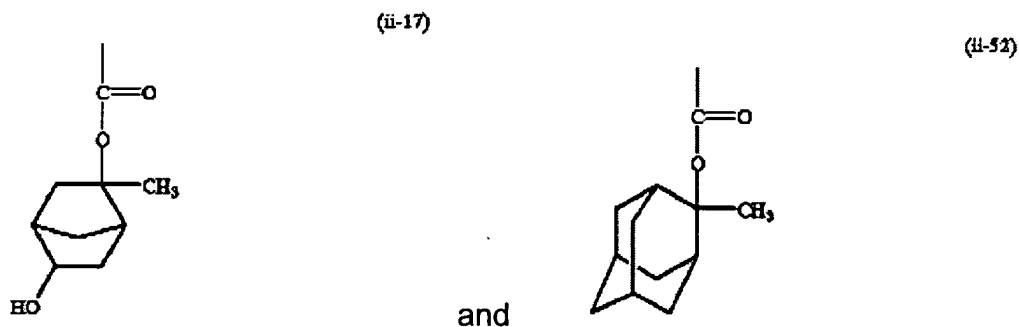
#### ***Claim Rejections - 35 USC § 103***

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
3. Claims 1-4, 6, 9-12, and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nishimura et al (US 6,800,414 B2).

In Example 18 (see Table 1), Nishimura teaches a photoresist composition containing Resin A-24 and a photoacid generator, and the resin (which is made in Synthesis Example 23) has the following repeating units:



Nishimura also teaches the equivalence of the following moieties as acid-labile groups (see col.14, lines 39-42, col.18, lines 25-35, and col.26, lines 15-25):



Therefore, based on Nishimura's teaching, it would have been obvious to one of ordinary skill in the art to replace the moiety (ii-52) with (ii-17) in Resin A-24 with a reasonable expectation of obtaining a resin composition having high transmittance of radiation, high sensitivity, resolution and pattern shape. The repeat unit (III-1) of Resin A-24 shown above, in which the (ii-52) moiety is replaced with (ii-17) moiety teaches present functional group of present claim 1 and present repeat unit of claim 6 (present  $R^2$  is  $-\text{CH}_3$ , present  $R^6$  is H, and present  $R^1$  and  $R^5$  taken together with  $-\text{C}(\text{R}^3)(\text{R}^4)]_2$  forming a 7 membered ring). Therefore, the prior art's teaching would render obvious present inventions of claims 1-4, 6, 9, and 10.

Nishimura also teaches the equivalence of the repeat unit (III-3) shown above and repeat unit made from a t-butyl acrylate (see col.38, lines 1-15, lines 33-35, lines 44-47, col.6, lines 36-45). Therefore, it would have been obvious to one of ordinary skill in the art to replace the repeat unit (III-3) with the repeat unit made from a t-butyl acrylate with a reasonable expectation of obtaining a resins composition having high

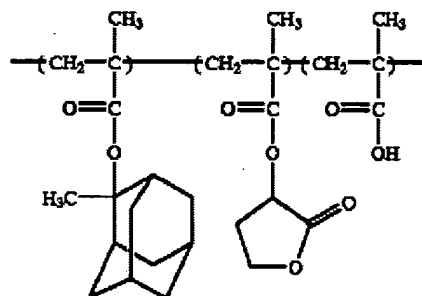
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transmittance of radiation, high sensitivity, resolution and pattern shape. Therefore, Nishimura's teaching would render obvious present inventions of claims 11 and 12.

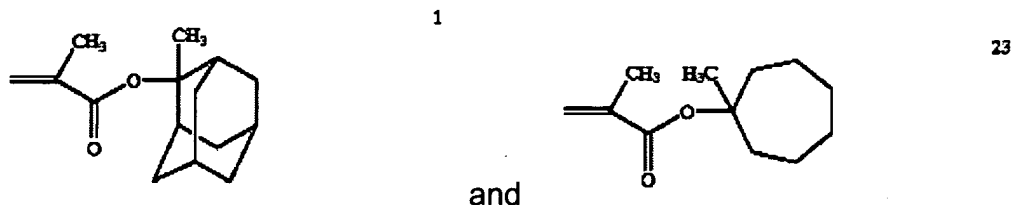
Nishimura teaches (col.52, lines 40-53) that a resist pattern is formed from his resin composition by applying the composition solution to a substrate to form a resist film. The resist film is then pre-baked and exposed to form a predetermined resist pattern. The exposed resist film is then developed to form a resist pattern (see col.53, lines 4-5). Therefore, Nishimura's teaching would render obvious present invention of claim 24.

4. Claims 1, 6, 7, 9, 14, and 18-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sato et al (US 6,596,458 B1).

In Example 1-1, Sato teaches a resin composition containing Resin 1-1 and a photoacid generator, and Resin 1-1 (which is made in Synthesis Example 1) has the following structure:



Sato also teaches (see col.31, lines 31-45, lines 56-65, col.34, lines 10-15) the equivalence of the following monomers (monomers 1 and 23) as the monomers that form the repeat unit of the general formula (pA) shown in col.31, lines 31-45:



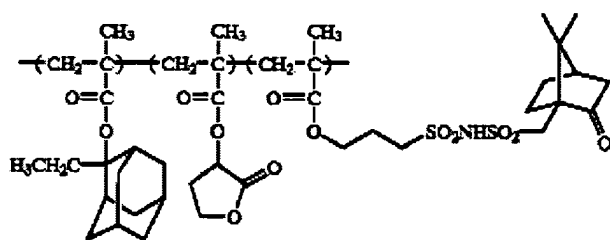
Sato also teaches that those alicyclic hydrocarbon groups can be substituted with *hydroxyl group* (see col.26, lines 22-29 (“... the alicyclic hydrocarbon groups formed by Z... [t]hese alicyclic hydrocarbon groups may have substituents”) and col.30, lines 44-46). Therefore, it would have been obvious to one of ordinary skill in the art to replace the first repeat unit of Resin 1-1 shown above with a repeat unit made from the monomer 23 shown above, in which the cycloheptyl ring is *substituted with a hydroxyl group* with a reasonable expectation of obtaining a positive resist composition in which development defects are prevented from being generated and which is excellent in resist pattern profiles. The repeat unit made from the monomer 23, in which the cycloheptyl ring is substituted with a hydroxyl group, teaches present functional group of present claim 1 and present repeat unit of claim 6 (present  $R^2$  is  $-\text{CH}_3$ , present  $R^6$  is H, and present  $R^1$  and  $R^5$  taken together with  $-\text{[C(R}^3\text{)(R}^4\text{)]}_n-$  forming a 7 membered ring). Therefore, Sato's teaching would render obvious present inventions of claims 1, 6, and 11.

In the general formula (pA) shown in col.31, lines 35-48, Sato also teaches that the R groups can represent a *halogen atom* as well as a hydrogen atom or an *alkyl group*. Therefore, it would have been obvious to one of ordinary skill in the art to replace the methyl group covalently attached to the ethylenically unsaturated carbon atom in the repeat unit made from the monomer 23

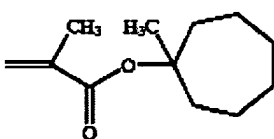
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with a fluorine group (since there are only four kinds of halogen atoms) with a reasonable expectation of obtaining a positive resist composition in which development defects are prevented from being generated and which is excellent in resist pattern profiles. Therefore, Sato's teaching would render obvious present invention of claim 7 (there is no requirement from the present claim language that the present repeat unit of claim 7 has to be a repeat unit separate (independent) from the repeat unit of claim 6).

*Sato also teaches the following resin (see col.57, lines 15-20) which third repeat unit is derived from an ethylenically unsaturated compound containing a polycyclic moiety:*



Sato also teaches (see col.31, lines 31-45, lines 56-65, col.34, lines 10-15, col.4, lines 15-20, line 48 ("R<sub>11</sub> represents a methyl group, an ethyl group . . .")) the equivalence of the first repeat unit of the resin shown above and the repeat unit made from the following monomer



23

Sato also teaches that those alicyclic hydrocarbon groups can be substituted with hydroxyl group (see col.30, lines 44-46). Therefore, it would have been obvious to one

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of ordinary skill in the art to replace the first repeat unit of the resin shown above with a repeat unit made from the monomer 23 shown above, in which the cycloheptyl ring is substituted with a hydroxyl group with a reasonable expectation of obtaining a positive resist composition in which development defects are prevented from being generated and which is excellent in resist pattern profiles. The repeat unit made from the monomer 23, in which the cycloheptyl ring is substituted with a hydroxyl group, teaches present functional group of present claim 1 and present repeat unit of claim 6 (present  $R^2$  is  $-\text{CH}_3$ , present  $R^6$  is H, and present  $R^1$  and  $R^5$  taken together with  $-\text{C}(\text{R}^3)(\text{R}^4)_n-$  forming a 7 membered ring).

Also, in the general formula (pA) shown in col.31, lines 35-48, Sato also teaches that the R groups can represent a *halogen atom* as well as a hydrogen atom or an *alkyl group*. Therefore, it would have been obvious to one of ordinary skill in the art to replace the methyl group covalently attached to the ethylenically unsaturated carbon atom in the repeat unit made from the monomer 23 with a fluorine atom (since there are only four kinds of halogen atoms) with a reasonable expectation of obtaining a positive resist composition in which development defects are prevented from being generated and which is excellent in resist pattern profiles. Therefore, Sato's teaching would render obvious present inventions of claims 1, 6, 7, 9, 14, 18, and 19 (there is no requirement from the present claim languages of claims 14 and 18 that the present repeat units (a) and (c) have to be two separate units).

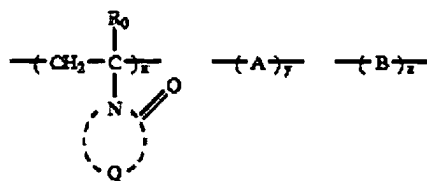


Sato teaches (col.53, lines 21-24) that his photoresist composition can further contain dissolution preventing compounds, and thus, the prior art's teaching would render obvious present invention of claim 20. Sato dissolves his composition in solvent such as 2-heptanone (see col.49, lines 28-51, col.50, lines 24-32). Therefore, Sato's teaching would render obvious present inventions of claims 21 and 22. Sato also teaches the use of a surfactant in his composition (see col.50, lines 64-67), and thus the prior art's teaching would render obvious present invention of claim 23.

Sato applies his resist solution onto a substrate (for example, silicon), followed by exposure through specified masks, baking and development to obtain a resist pattern (see col.53, lines 59-67). Therefore, Sato's teaching would render obvious present inventions of claims 24-26.

5. Claims 1, 6-8, and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yabuuchi (5,945,267).

Yabuuchi teaches a silver halide color *photographic light sensitive* material comprising a support having thereon *photographic component* layers including a silver halide emulsion layer, at least one of the component layers containing a coupler of his invention (see col.1, lines 51-52, col.2, lines 1-22). Yabuuchi furthermore teaches (col.24, lines 40-67, col.25, lines 1-28) that the component layer containing the coupler preferably further contains a polymeric compound having a repeating unit represented by the following formula:



in which A and B each represents an ethylenic unsaturated compound which is copolymerizable. As one of the examples for the ethylenic unsaturated compound, Yabuuchi teaches (1,1-dimethyl-3-hydroxybutyl)methacrylate (*based on the fact that Yabbuchi separately teaches N-(1,1-dimethyl-3-hydroxybutyl)acrylamide in col.25, lines 12-13, the "N-" as in "N-(1,1-dimethyl-3-hydroxybutyl)methacrylate" cited in col.25, lines 14-15 is believed to be a typographical error*). Therefore, it would have been obvious to one of ordinary skill in the art to use the monomer of (1,1-dimethyl-3-hydroxybutyl)methacrylate to form the repeating unit of "A" in the formula shown above with a reasonable expectation of obtaining a silver halide photographic light sensitive material having high sensitivity and low fog and superior storage stability. The monomer of (1,1-dimethyl-3-hydroxybutyl)methacrylate teaches present formula of claims 1 and 6 (present X would be a methyl group, present R<sup>1</sup> and R<sup>2</sup> would both be methyl groups, present R<sup>3</sup> and R<sup>4</sup> would be H atoms, present n would be 1, present R<sup>5</sup> would be H atom, and present R<sup>6</sup> would be a methyl group). Therefore, the prior art's teaching would render obvious present inventions of claims 1 and 6.

With respect to present claims 7 and 8, Yabuuchi also includes halogenated olefin (e.g., vinyl chloride) among those examples for his ethylenic unsaturated compound that makes up those repeating units "A" and "B". Therefore, it would have been obvious to one of ordinary skill in the art to use the monomer of (1,1-dimethyl-3-

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hydroxybutyl)methacrylate to form the repeating unit of "A" in the formula shown above and furthermore use the monomer of vinyl *fluoride* (because there are only four halogen atoms) to form the repeating unit of "B" with a reasonable expectation of obtaining a silver halide photographic light sensitive material having high sensitivity and low fog and superior storage stability. Therefore, the prior art's teaching would render obvious present inventions of claims 7 and 8.

With respect to present claim 11, Yabuuchi also includes methyl acrylate among those examples for his ethylenic unsaturated compound that makes up those repeating units "A" and "B". Therefore, it would have been obvious to one of ordinary skill in the art to use the monomer of (1,1-dimethyl-3-hydroxybutyl)methacrylate to form the repeating unit of "A" in the formula shown above and furthermore use the monomer of methyl acrylate to form the repeating unit of "B" with a reasonable expectation of obtaining a silver halide photographic light sensitive material having high sensitivity and low fog and superior storage stability. Therefore, the prior art's teaching would render obvious present invention of claim 11.

#### ***Allowable Subject Matter***

6. Claims 5, 13, and 15-17 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. None of the references cited teaches or suggest the present hydroxyl ester functional group of PinAc or PinMAc of claim 5 nor the present repeat unit of NB-F-OH of claim 13. Sato does not teach or suggest a repeat unit derived from the present ethylenically unsaturated compounds of

claim 15. Sato does not teach or suggest a repeat unit derived from the present polycyclic ethylenically unsaturated compounds of claim 17.

***Response to Arguments***

7. Applicants argue that the rejections over Yabuuchi'267 should be withdrawn because there is no chemical compound known as "N-(1,1-dimethyl-3-hydroxybutyl)methacrylate". However, as discussed above, based on the fact that Yabuuchi separately teaches N-(1,1-dimethyl-3-hydroxybutyl)acrylamide in col.25, lines 12-13, it is the Examiner's position that *one of ordinary skill in the art* reading Yabuuchi would recognize that the "N-" as in "N-(1,1-dimethyl-3-hydroxybutyl)methacrylate" cited in col.25, lines 14-15 is a typographical error and that Yabuuchi is teaching (1,1-dimethyl-3-hydroxybutyl)methacrylate. Therefore, present rejection over Yabuuchi still stands.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sin J. Lee whose telephone number is 571-272-1333. The examiner can normally be reached on Monday-Friday from 9:00 am EST to 5:30 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cynthia Kelly, can be reached on 571-272-1526. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR.

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Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should

you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free).

*S. J. Lee*

S. Lee

February 17, 2005

*Sin J. Lee*

Sin J. Lee

Patent Examiner

Technology Center 1700